

## Comments In Support of RM-11392

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To: Federal Communications Commission

Thursday, December 27, 2007

1. I wish to express total support of RM-11392. This petition should be adopted and included in Part 97 as soon as possible.
2. As outlined in the petition, bandwidth limitations have existed for the CW/RTTY portions of the amateur radio spectrum for many, many years in Part 97.317(f)(4). Refining the rules and regulations to fit current technology is a task the FCC performs every day. This petition is not asking for anything else than that.
3. The Amateur Radio Service is a shared spectrum environment. The two primary metrics for measuring spectrum efficiency in such an environment is the amount of spectrum that a specific communication session denies to other users and the amount of time that spectrum is denied to others. The use of ever wider protocols in the CW/RTTY portions of the amateur bands lowers spectrum efficiency of these spectrum areas based on both metrics. There are currently \*no\* current wide modes in use on the amateur bands that provide for sharing of frequency spectrum. They are all session oriented protocols which require total dedication of the spectrum being used, e.g. Pactor III, wideband Olivia, mt63, etc. This is actually a step back from the ax.25 protocol developed over 25 years ago for use on the ham bands. Using the "spectrum denied to others" metric, these wide modes have a lower spectrum efficiency than narrower modes. With the exception of Pactor III, all of these modes are primarily for keyboard-to-keyboard communications so the amount of time the spectrum they use is dependent not on raw data speed but on the amount of time the communication session between the two amateurs lasts. This, one again, gives the wideband modes a lower spectrum efficiency than a narrower mode capable of transmitting at the speed most amateurs can compose original text. In summary, wider and faster modes in the amateur

bands will not provide any spectrum efficiency increase. They cannot do so purely based on the way they are used.

4. In the case of Pactor III, its spectrum efficiency increase based on the time spectrum is denied to others is cancelled by the amount of spectrum that it denies to others. There is also some question about the amount of time the use of Pactor III denies spectrum to other amateurs. Since its primary use is on automated internet access links which operate at random times and since its busy detection scheme is very, very poor, other amateurs tend to avoid the frequencies used by these automated robots thus effectively denying this spectrum to other amateurs on a 24/7 basis. This is very spectrum inefficient.
5. In the commercial spectrum world, the competing interests of spectrum cost and demand work to push commercial vendors to develop new methods of making the best use of costly spectrum in order to meet customer demand. In the amateur radio environment the spectrum cost part of that equation is missing. This biases the development of new techniques to focus primarily on expanding transmission bandwidth in order to provide faster data transfer speeds instead of focusing on making the best use of minimum spectrum.
  - a. Winlink 2000 has a system where a single hub with a single transmitter monitors multiple operating frequencies. When a connection to the hub occurs on one frequency the other frequencies become "killer trunks" where stations wishing to connect continue calling thus denying those "killer" frequencies to other use. This is a very spectrum inefficient mode of operation. With "free" spectrum available for use in this manner, however, there is no driver to force more efficient operation. Redesigning the system to use a single "connection" frequency with users dispatched to traffic carrying frequencies would provide a much higher spectrum efficiency. This solution has been proposed to the Winlink 2000 system administrators multiple times but with no economic driver to push the change, it has been disregarded.
  - b. The ARRL has had working committees investigating the use of digital modes in the amateur spectrum recommend that 20kHz bandwidths in the HF bands be developed for providing higher speed general access internet links. These communication channels could be tied up for

hours merely by a single ham browsing the internet. With no spectrum cost in the amateur spectrum, there is no limiting factor to prevent such developments from actually occurring thus making the spectrum efficiency in the amateur bands two orders of magnitude less than it is today (2khz data channels x 10 x 10).

Lacking the spectrum cost factor that drives commercial development of efficient operating modes, the use of bandwidth limits is an effective replacement. Not only will the bandwidth limit derived by Mr. Miller keep the current spectrum efficiency at its highest levels in the amateur service it will act as an effective driver to develop more efficient transmission techniques, e.g. a mixture of QAM and OFDM rather than ever wider OFDM modes. Rather than seeking to destroy innovation in the amateur radio service, this petition seeks to foster innovation.

6. This petition will not impact the operation of *any* HF emergency communication networks. They will be able to operate just as they do today. Most emergency communication networks operate with limited power, inefficient antennas, and during poor propagation conditions (e.g. high atmospheric noise). Environments such as this do not generally use the highest data transfer modes of even Pactor III. Pactor III will usually fall back to lower transmission rates during these periods.
7. No existing amateur transmission modes except ax.25 (i.e. packet radio) does any time division multiplexing operation. The transmission protocols in use are session oriented. In the case of Pactor, the protocol is very dependent on synchronous transmission and receipt of acknowledgement packets for protocol operation. It is simply not capable of time division multiplexing operation.
8. This petition will, in no way, inhibit the introduction of or experimentation with any new digital mode. The petition requests no changes in any band above 28Mhz. Spectrum above 28Mhz will remain open for any experimentation with new modes and will provide spectrum for introduction of new modes.
9. Those who propound the use of wider modes on HF in the amateur service do not consider the impact of those wider modes on the spectrum efficiency needed in the amateur bands in order to maximize the ability of the bands

to handle the number of amateurs wishing to access spectrum. Even modes such as MIL-STD-188-110 do not provide time-division multiplexed operation, the connections provided by these modems are still session oriented. While they may provide higher speeds, it has not been shown how this speed can be implemented to provide higher spectrum efficiency on the amateur bands. If these wider, faster modes are used solely to provide faster access for general internet access, it is extremely doubtful that any shorter access times per user will be seen than already exist. The largest time component of general internet access is reading and comprehending the content that appears on the screen and not the time spent in transmitting the data. Even 300baud transmission rates can put text on the screen faster than most people can read and analyze it. As long as the connection is session oriented and is not multiplexed as ax.25 is, there will be no net time savings useful in decreasing the amount of time the spectrum being used is denied to others.

It is imperative that the interest of spectrum efficiency be given significant weight in determining what can be allowed on the amateur spectrum. This is especially true in light of the coming sunspot cycle increase which will put even more demands on the HF amateur spectrum than exists today. Limiting spectrum efficiency so that a few amateurs can indulge a personal need for faster internet access at the cost of the ability of the general amateur population to use the spectrum is not in the best interest of the Amateur Radio Service.

10. In summary:

- the use of ever wider OFDM signals is not "advancing the art of radio".
- bandwidth limits in the CW/RTTY portions of the bands are not new.
- wider bandwidths do not enhance spectrum efficiency in session oriented modes.
- spectrum cost factors must be replaced by other factors in the amateur radio service to prevent inefficient operation of systems using trunked designs for customer access.

11. The regulatory changes in RM-11392 will result in the following:

- less interference in the automatic subbands from modes that increase spectrum occupancy without regard for adjacent channel interference.
- increased incentive to efficiently design systems offering automatic

station access to their customers.

-increased incentive to investigate alternative methods of increasing data rates other than ever wider OFDM signals

12. This petition is well written and technically accurate. It provides factual data on which to base its conclusions and recommendations rather than generalized platitudes about disenfranchisement and killing innovation.
13. As defined in Part 97.2 the Amateur Radio Service is "A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs,". Many of the negative comments on this petition are from amateurs who wish to turn the ARS into a service providing amateur-to-3rd party communications or 3rd party-to-3rd party communications. It is this that is driving the need for ever faster data transfer methods and not amateur-to-amateur communications. Nothing in Part 97 guarantees that the ARS will be able to compete with common carrier services in providing internet communication links to 3rd parties, not even to 3rd parties associated with emergency or disaster relief. The mere fact that those 3rd parties are driving the requests for more spectrum shows the contaminating influence that the paradigm of the ARS as a common carrier can have.

I urge the Federal Communication Commission to make the changes to Part 97 that are requested in the petition. They will result in more innovation and better spectrum efficiency in the Amateur Radio Service.

Respectfully,

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